Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SAU-GEE CHEN and
CHIEH-CHIH LI

Appeal No. 1997-3424
Application No. 08/510,740

ON BRIEF

Before KRASS, RUGGIERO, and BLANKENSHIP, Administrative Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 1-4, which are all of the claims pending in the application.

The claimed invention relates to a digital information processing system which employs a method of finding a quotient from a divisor and a dividend. According to Appellants (specification, pages 4-6), the speed of processing is increased

by separating the sign detection of the remainder operation from the remainder subtraction operation.

Claim 1 is illustrative of the invention and reads as follows:

1. In a system for digital information processing, said system having a memory, a method for generating data representative of a quotient $Q=a_0a_1a_2....a_b$ from data representative of a divisor $Y=y_1y_2....y_n$ and data representative of a dividend $X=x_1x_2....x_a$, comprising the steps of:

(a) aligning the first non-zero bit of X with the first non-zero digit of Y;

(b) defining a signed-digit partial remainder series R_i where $R_0=Y$, a first sign series of the partial remainder S_i where $S_0=0$, a second sign series of the partial remainder S_{ri}, a quotient bit series a_i, and a counter i beginning from zero;

(c) subtracting X from R_i which yields next signed-digit partial remainder R_{i+1};

(d) setting the sign of R_{i+1} to S_{ri+1};

(e) setting the result of exclusive-OR of S_i and S_{ri+1} to the true sign of the next remainder S_{i+1};

(f) setting a_i to 1 if $S_{i+1}=0$ or $R_{i+1}=0$;

(g) setting a_i to 0 if $S_{i+1}=1$;

(h) inverting the signs of all digits of R_{i+1} if $S_{i+1}=1$;

(i) shift R_{i+1} left by one bit;

(j) adding 1 to i;

(k) repeating steps (c) to (j) until i reaches a predetermined value or $R_{i+1}=0$;

and

(l) storing in said memory as said data representative of a quotient, a quotient resulting from step (k).

No prior art references are relied on by the Examiner.

Claims 1-4 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter in the form of a mathematical algorithm.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs and the Answers for the respective details thereof.[1]

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner and the reasons relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answers.

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[1] The Appeal Brief (Paper No. 14) was filed October 23, 1996. In response to the Examiner's Answer (Paper No. 15) dated April 1, 1997, a Reply Brief (Paper No. 16) was filed June 5, 1997, which was acknowledged and entered by the Examiner in the communication (Paper No. 17) dated August 26, 1997. In response to a remand from the Board, the Examiner submitted a Supplemental Examiner's Answer (Paper No. 21) on May 23, 2001.

It is our view, after consideration of the record before us that claims 1-4 are directed to statutory subject matter within the meaning of 35 U.S.C. § 101. Accordingly, we reverse.

In the original Examiner's Answer, the rejection under 35 U.S.C. § 101 was made using the Freeman-Walter-Abele test. See In re Freeman, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978) as modified by In re Walter, 618 F.2d 758, 205 USPQ 397 (CCPA 1980) and In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA 1982). This case was remanded to the Examiner by the Board to consider the effect on this appeal by the decisions in State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998), cert. denied, 119 S. Ct. (1999) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999). Upon remand and consideration of these decisions, the Examiner determined that the rejection was still appropriate (Supplemental Answer).

More particularly, the Examiner finds the mathematical algorithm of the claimed invention to be nothing more than an abstract idea with no practical application or useful result. Appellants argue that a series of specific operational steps to be performed on or with the aid of a digital processing system (such as a computer) is a statutory process.

With respect to the mathematical algorithm exception, the Federal Circuit in State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1600 (Fed. Cir. 1998) first identified the judicially created three categories that are not patentable (laws of nature, natural phenomena and abstract ideas) citing Diamond v. Diehr, 450 U.S. 175, 209 USPQ 1 (1981). The opinion went on to note "the mathematical algorithm is unpatentable only to the extent that it represents an abstract idea....", and is thus not "useful." State Street Bank 149 F.3d at 1373 & n.4, 47 USPQ2d at 1600-01 & n.4. Later in its opinion, the court returned to this issue: "[T]he mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" State Street Bank 149 F.3d at 1374, 47 USPQ2d at 1602. In this case, the court stated that "the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm ... because it produces

'a useful, concrete and tangible result' ...." State Street Bank 149 F.3d at 1373, 47 USPQ2d at 1601.

Significantly, the court concluded its analysis of the mathematical algorithm issue as follows: "The question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to . . . but rather on the essential characteristics of the subject matter, in particular, its practical utility." State Street Bank 149 F.3d at 1375, 47 USPQ2d at 1602.

We agree with Appellants that the invention as set forth in the appealed claims represents statutory subject matter. As the Federal Circuit noted in State Street, supra, the focus should be on the practical utility of the claimed subject matter. In our view, a method being run on a computer inherently has practical utility and represents more than a mere abstract idea. An abstract idea is no longer abstract when it becomes tied to implementation on a computer. As long as this computer-implemented process satisfies other conditions of Title 35, it is properly the subject of patent protection. Therefore, we hold that the appealed claims before us, which require the presence of a computer to implement the process, are directed to a useful invention within the meaning of 35 U.S.C. § 101.

In conclusion, we have not sustained the Examiner's 35 U.S.C. § 101 rejection of the claims on appeal. Therefore, the Examiner's decision rejecting claims 1-4 is reversed.

REVERSED

ERROL A. KRASS)
Administrative Patent Judge)
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JOSEPH F. RUGGIERO) BOARD OF PATENT
Administrative Patent Judge) APPEALS
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